



(12) **EUROPEAN PATENT APPLICATION**

(88) Date of publication A3:
10.10.2012 Bulletin 2012/41

(51) Int Cl.:
H01L 51/42 (2006.01)

(43) Date of publication A2:
20.04.2011 Bulletin 2011/16

(21) Application number: **10166568.5**

(22) Date of filing: **18.06.2010**

(84) Designated Contracting States:
AL AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR
Designated Extension States:
BA ME RS

(30) Priority: **15.10.2009 KR 20090098412**

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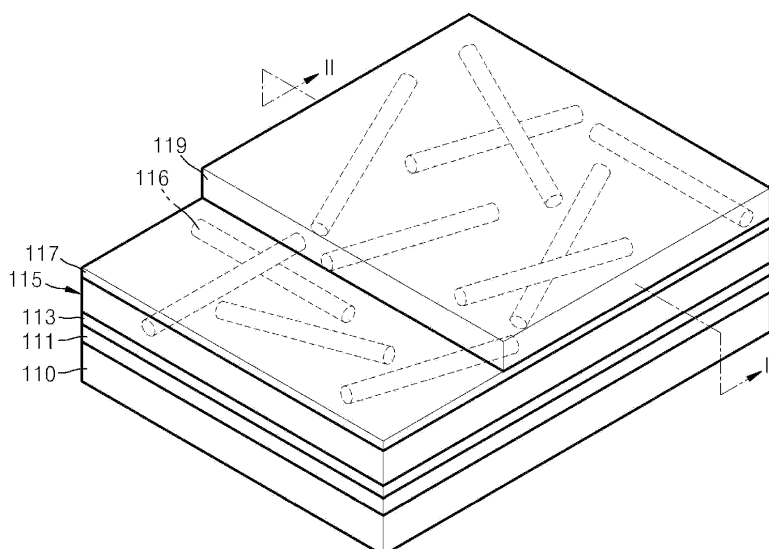
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(54) **Solar Cell Having Organic Nanowires**

(57) Example embodiments relate to a solar cell including organic nanowires. The solar cell may include a

photoelectric conversion layer formed of a p-type material including an organic material and an n-type material including organic nanowires.

FIG. 1





EUROPEAN SEARCH REPORT

Application Number
EP 10 16 6568

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	A. M. C. NG, W. Y. TONG, A. B. DJURISIC, W. K. CHAN: "Perylene Tetracarboxylic Diimide (PTCDI) nanowires: synthesis and characterisation", PROC. OF SPIE, vol. 6321, 63210N, 2006, pages 1-8, XP002681857, DOI: 10.1117/12.677626	1,2,10, 13	INV. H01L51/42
Y	* the whole document *	4,5,7	
Y	TANG C W: "TWO-LAYER ORGANIC PHOTOVOLTAIC CELL", APPLIED PHYSICS LETTERS, AIP, AMERICAN INSTITUTE OF PHYSICS, MELVILLE, NY, US, vol. 48, no. 2, 13 January 1985 (1985-01-13), pages 183-185, XP000996828, ISSN: 0003-6951, DOI: 10.1063/1.96937	4,5,7	
A	FR 2 892 563 A1 (COMMISSARIAT ENERGIE ATOMIQUE [FR]) 27 April 2007 (2007-04-27) * page 17, line 29 - page 20, line 15 *	1,3-7, 9-12	TECHNICAL FIELDS SEARCHED (IPC) H01L
A	ALEJANDRO L. BRISENO ET AL: "Perylenediimide Nanowires and Their Use in Fabricating Field-Effect Transistors and Complementary Inverters", NANO LETTERS, vol. 7, no. 9, 1 September 2007 (2007-09-01), pages 2847-2853, XP55035590, ISSN: 1530-6984, DOI: 10.1021/nl071495u * the whole document *	1,2	
The present search report has been drawn up for all claims			
Place of search The Hague		Date of completion of the search 16 August 2012	Examiner Königstein, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03.82 (P04C01)



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Application Number
EP 10 16 6568

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
A	CHANG M Y ET AL: "Polymer solar cells incorporating one-dimensional polyaniline nanotubes", ORGANIC ELECTRONICS, ELSEVIER, AMSTERDAM, NL, vol. 9, no. 6, 1 December 2008 (2008-12-01), pages 1136-1139, XP025546174, ISSN: 1566-1199, DOI: 10.1016/J.ORGEL.2008.08.001 [retrieved on 2008-08-15] * the whole document *	1,3	
A	YANG FAN ET AL: "Morphology control and material mixing by high-temperature organic vapor-phase deposition and its application to thin-film solar cells", JOURNAL OF APPLIED PHYSICS, AMERICAN INSTITUTE OF PHYSICS. NEW YORK, US, vol. 98, no. 1, 8 July 2005 (2005-07-08), pages 14906-014906, XP012077779, ISSN: 0021-8979 * the whole document *	1,2,4,5, 8,10	
The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search The Hague		Date of completion of the search 16 August 2012	Examiner Königstein, C
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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EPO FORM 1503 03/02 (P04C01)

